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ORIGINAL RESEARCH

Multidisciplinary Management of Spondyloarthritis-Related Immune-Mediated Inflammatory Disease

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ABSTRACT

Introduction: Immune-mediated inflammatory diseases (IMIDs) are chronic autoimmune conditions that share common pathophysiologic mechanisms. The optimal management of patients with IMIDs remains challenging

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Ignazio Olivieri: Deceased. This manuscript is dedicated to the memory of Ignazio Olivieri who participated in the present manuscript.

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because the coexistence of different conditions requires the intervention of several specialists. The aim of this study was to develop a series of statements defining overarching principles that guide the implementation of a multidisciplinary approach for the management of spondyloarthritis (SpA)-related IMIDs including SpA, psoriasis, psoriatic arthritis, Crohn's disease, ulcerative colitis and uveitis.

Methods: A Delphi consensus-based approach was used to identify a core set of statements. The process included development of initial questions by a steering committee, an exhaustive search of the literature using complementary approaches to identify potential statements

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and two Delphi voting rounds for finalization of the statements.

Results: Consensus was achieved on the related nature of IMIDs, the existence of a high prevalence of multiple IMIDs in a single patient and the fact that a multidisciplinary approach can result in a more extensive evaluation and comprehensive approach to treatment. The goals of a multidisciplinary team should be to increase diagnosis of concomitant IMIDs, improve the decision-making process, and increase patient satisfaction and adherence. Early referral and diagnosis, early recognition of concomitant IMIDs and optimizing treatment to improve patient quality of life are some of the advantages of using multidisciplinary teams. To be effective, a multidisciplinary team should be equipped with the appropriate tools for diagnosis and follow-up, and at a minimum the multidisciplinary team should include a dermatologist, gastroenterologist and rheumatologist; providing psychologic support via a psychologist and involving an ophthalmologist, general practitioners and nurses in multidisciplinary care is also important.

Conclusion: The present Delphi consensus identified a set of overarching principles that may be useful for implementation of a

multidisciplinary approach for the management of SpA-related IMIDs.

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Keywords: Crohn's disease; Immune-mediated inflammatory disease; Multidisciplinary; Psoriasis; Psoriatic arthritis; Spondyloarthritis; Ulcerative colitis; Uveitis

INTRODUCTION

The term “immune-mediated inflammatory diseases” (IMIDs) defines a group of chronic autoimmune conditions that share common pathophysiologic mechanisms [1, 2]. A large body of evidence shows that multiple IMIDs can coexist within the same patient and within families, as a consequence of shared genetic predisposing factors [1, 3]. The fact that distinct IMIDs, including psoriasis (Pso), psoriatic arthritis (PsA), spondyloarthritis (SpA) and inflammatory bowel disease (IBD), may be effectively treated by targeting the same inflammatory mediator [e.g., tumor necrosis factor- α (TNF- α)] further demonstrates a common underlying pathophysiology [2, 4].

With the introduction of biologic therapies over the past 2 decades, remarkable progress has

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been achieved in the treatment of individual IMIDs. However, optimal management of patients with IMIDs remains challenging because the coexistence of different conditions requires the intervention of several specialists, typically a rheumatologist, dermatologist and gastroenterologist. Validated strategies for an integrated and comprehensive assessment and treatment of IMIDs that consider all disease manifestations, instead of considering each IMID individually, are lacking or are just beginning to emerge in various settings, including SpA, IBD and psoriatic disease [5–8]. The design of such strategies is complex and requires a close collaboration between specialists.

As far as the management of IMID patients is concerned, multidisciplinary care provided by a team composed of several healthcare professionals is considered a valuable approach and is widely recommended. For example, the guidelines for the management and treatment of rheumatoid arthritis (RA) patients issued in 2009 by the UK National Institute for Health and Clinical Excellence (NICE) emphasize the importance of comprehensive management of patients with RA [9]. Recommendations from many scientific societies for the main SpA-related IMIDs, including PsA and axial SpA, stress the importance of the multidisciplinary approach in the management of these diseases.

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Overarching principle 2 from the 2015 GRAPPA treatment recommendations for patients with PsA states that “Multidisciplinary and multi-specialty assessment and management will be most beneficial for individual patients” [10], the 2015 update of the EULAR recommendations for the management of PsA overarching principle C states that “Rheumatologists are the specialists who should care for the musculoskeletal manifestations of patients with PsA; in the presence of clinically significant skin involvement a rheumatologist and a dermatologist should collaborate in diagnosis and management” [6], and the 2016 update of the ASAS-EULAR management recommendations for axial SpA overarching principle 1 states that “Axial SpA is a potentially severe disease with different manifestations, usually requiring multidisciplinary management coordinated by the rheumatologist” [11].

However, the evidence supporting the effectiveness of this strategy is very limited. Most clinical studies comparing management by a multidisciplinary team with conventional management are from the rheumatology field and their results are controversial [12, 13]. Moreover, establishing a multidisciplinary team is a demanding process that may not be feasible [14–16]. The composition of the multidisciplinary team and other characteristics may vary according to different settings. However, regardless of the setting, formal coordination of the team and common definition of the goals are crucial for the successful implementation of this approach [14].

To encourage the adoption of a multidisciplinary approach for the management of SpA-related IMIDs including SpA, Pso, PsA, IBD [Crohn’s disease (CD) and ulcerative colitis (UC)] and uveitis, a panel of experts in rheumatology, dermatology, gastroenterology and ophthalmology set out to define overarching principles that guide the implementation of such an approach. Toward this aim, questions addressing the relevant issues regarding multidisciplinary care for SpA-related IMIDs were drafted by a steering committee, and a systematic review of the literature was performed to answer these questions, producing preliminary statements. Two rounds of Delphi were then

conducted among the panel of experts to identify the final 13 consensus statements presented in this article, each referring to one of the discussed questions. The main objective of these statements is to inform dermatologists, gastroenterologists and rheumatologists about the rationale and value of an integrated approach to SpA-related IMIDs and to promote and guide towards the institution of multidisciplinary teams for the management of patients affected by these conditions.

METHODS

The consensus statements presented in this article were produced within the BRIDGE (Be Refocused on Immunology, Dermatology, Gastroenterology and Rheumatology) project, aimed at promoting collaboration among IMID specialists. The main objective of the process was to produce a series of statements defining overarching principles of the multidisciplinary management of SpA-related IMIDs including SpA, PsO, PsA, CD, UC and uveitis, supported by published evidence or based on expert consensus. Consensus was generated by means of a modified Delphi method, an interactive technique that develops consensus in two or more rounds of questions submitted to a panel of experts [17–19]. The consensus-finding process (Fig. 1) consisted of three phases (phases 1, 2 and 3) and took from April 2016 to March 2017 to complete. This article does not contain any novel studies with human or animal subjects performed by any of the authors.

Phase 1

In April 2016, a steering committee composed of a dermatologist (GG), gastroenterologist (FR) and rheumatologist (IO) met to identify IMID experts who could be part of the scientific board to define the objectives and topics covered by the statements and to plan the entire consensus-finding process. The IMID experts, seven rheumatologists, seven dermatologists, six gastroenterologists and one ophthalmologist, were selected based on their publication record in the IMID field and previous contributions to similar

activities; most of these experts had direct experience (i.e., clinical practice) in the multidisciplinary management of SpA-related IMIDs. The steering committee drafted nine questions addressing relevant issues associated with the multidisciplinary approach to SpA-related IMIDs and proposed answers based on published evidence and expert opinion. The questions addressed the following issues: (1) the context and rationale for adopting a multidisciplinary approach; (2) the value of the multidisciplinary approach throughout all stages of patient management; (3) goals of the multidisciplinary team; (4) composition of the multidisciplinary team. To provide further evidence-based support to the answers, a systematic review of the literature was planned. In a second meeting held in July 2016 and attended by the entire scientific board (steering committee and experts), the nine questions and their answers were finalized and the details of the systematic search of the literature were established.

Phase 2

A systematic PubMed search was performed using pre-defined key words and inclusion criteria. Based on the evidence extracted from the selected articles, the answers to the nine questions were defined and produced a total of 52 statements. At a third meeting held in October 2016, the preliminary version of the statements was presented to the scientific board; the statements were then reviewed and finalized to produce the first version of the statements to be submitted to the first round of the Delphi process. Great care was taken to reduce redundancy and to improve the clarity and readability of the statements. The questions were reduced from 9 to 7 and the number of related statements was reduced from 52 to 13 by removing repetitions and, when possible, by collapsing multiple statements.

The first Delphi round was performed online: the document containing the first version of the statements was made available via a secure server to the members of the scientific board, who were asked to express their agreement or disagreement on each statement using a 5-point Likert scale (1, strongly disagree; 2, disagree; 3,

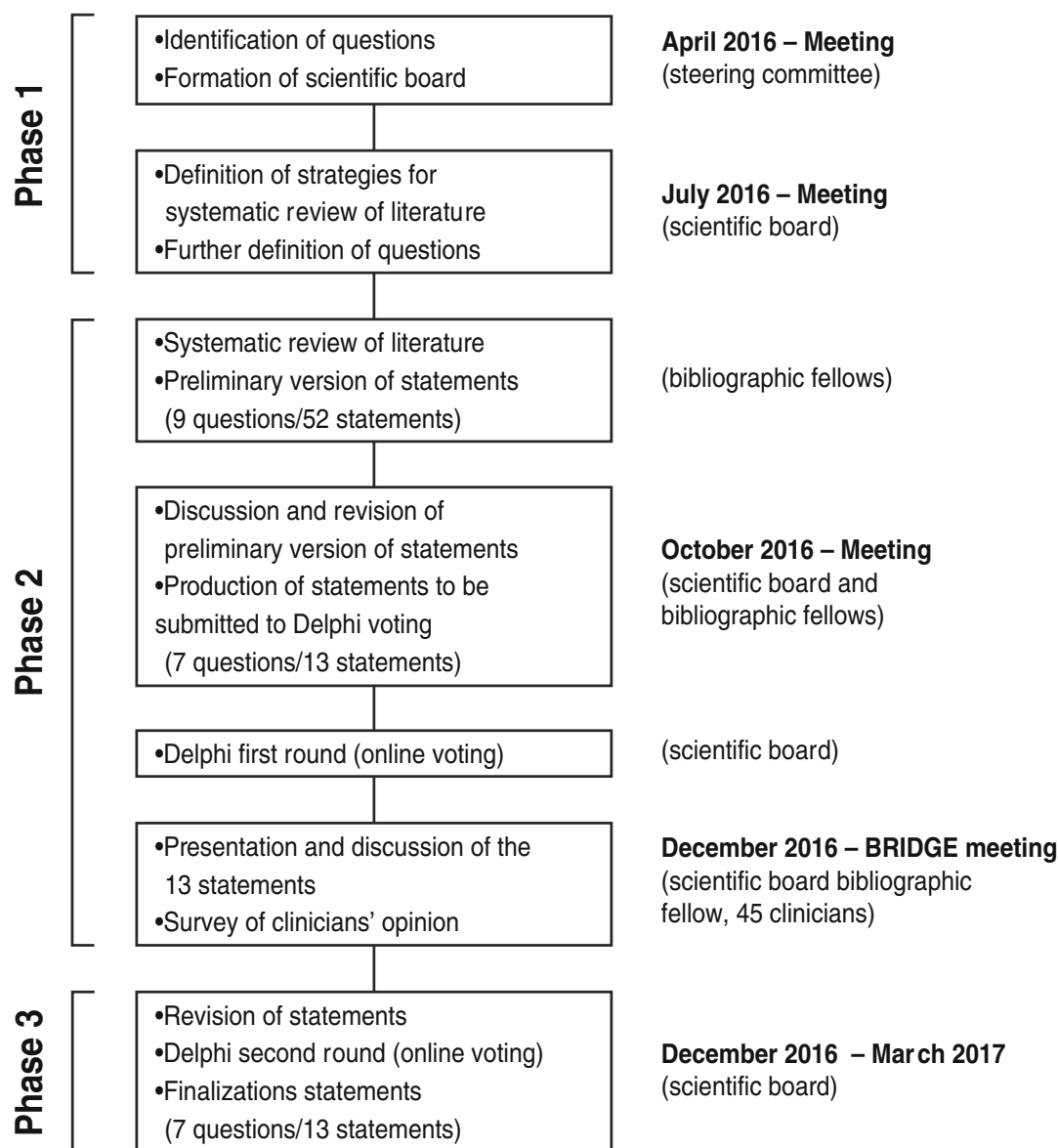


Fig. 1 Process leading to the formulation of the 13 consensus statements about the multidisciplinary management of spondyloarthritis-related immune-mediated inflammatory diseases (IMIDs)

undecided; 4, agree; 5, strongly agree). Positive consensus was achieved when the proportion of voters selecting items 4 and 5 was $\geq 80\%$.

In December 2016, a plenary BRIDGE meeting was organized to further discuss the statements and the supporting literature and get feedback from a wider audience of clinicians composed of rheumatologists, dermatologists and gastroenterologists selected to represent IMID management over the entire national

territory. To improve discussion, the clinicians were first subdivided into interdisciplinary groups to discuss the statements with the scientific board and the bibliographic fellows and asked to express their agreement or disagreement afterward in a voting session held during the meeting, using an iPad application. The results of the voting were not part of the Delphi process and were collected only to investigate the opinion of a wider audience of clinicians.

Phase 3

In this phase, the results of the first online Delphi voting were evaluated and made available online via a secure server to all scientific board members, along with the results of the survey held during the plenary BRIDGE meeting. Each member was asked to evaluate the results. Based on comments emerging from the discussions held at the BRIDGE meeting and on the results of the first Delphi round, the statements were further refined, with minor changes. The final version of the statements was then submitted to a second Delphi round, performed online as in the first round and involving all members of the scientific board, to confirm the achievement of consensus on all statements.

RESULTS AND DISCUSSION

A positive consensus among the experts was reached regarding almost all statements following the first Delphi round. No consensus was reached on two statements concerning the composition of the multidisciplinary team (75% of the experts agreed, 15% were uncertain, and 10% disagreed on the inclusion of ophthalmologists in the IMID team; 75% agreed, 20% were uncertain, and 5% disagreed on the need to provide psychologic support to IMID patients). Based on a discussion among the panel members, the wording of a few statements was changed for the sake of clarity and to reduce redundancies. No changes to the meaning of the statements were made. After the second Delphi round, full positive consensus was reached on all statements. The only statement for which the positive consensus was not full (100%) was that concerning the composition of the IMID team, with 5% of the experts disagreeing on each one of the items related to this issue and 5–10% being uncertain about them. Questions and statements are shown in Table 1, along with the agreement level reached after the second Delphi round.

In the following sections, we present the evidence that led to the formulation of each statement and to the final consensus. We are aware that relevant data may have been published after the last update of the literature searches (October

2016) and that this may constitute an important limitation of our study. This study may also be limited in terms of evidence supporting the effectiveness of the multidisciplinary approach (i.e., few published articles and especially in the dermatologic-rheumatologic field for PsA-Pso). However, the current work, in addition to the evidence in the literature, has also used an expert-based approach and emphasizes the importance of the multidisciplinary approach in stimulating a broader application that may eventually lead to more studies being published on the subject.

Rationale for a Multidisciplinary Approach to SpA-Related IMID Management (Statements 1a, 1b, 1c)

A large body of evidence from epidemiologic studies indicates that patients with chronic inflammatory conditions including Pso, PsA, SpA and IBD are frequently affected by other IMIDs. Up to 30% of patients with Pso are also affected by PsA [20, 21]. According to the results of a recent meta-analysis, ~ 10–15% of patients with Pso have undiagnosed PsA [22]. A retrospective study analyzing 2006–2010 data from the UK Clinical Practice Research Datalink including patients with Pso ($n = 27,672$) and PsA ($n = 1952$) has shown that patients with severe Pso have significantly higher rates of comorbidities, including arthritis, than those with mild Pso; patients with PsA have significantly higher rates of arthritis and ankylosing spondylitis than those with severe Pso [23]. The coexistence of several IMIDs is also widely documented for SpA and in particular ankylosing spondylitis. According to a meta-analysis of 143 studies reporting the prevalence of uveitis, Pso and IBD in patients with ankylosing spondylitis ($n = 44,372$), the pooled prevalences of these conditions were 25.8%, 9.3% and 6.8%, respectively [24]. As for the coexistence of various IMIDs in patients with IBD, a recent study involving a European cohort of 1145 IBD patients followed up for 10 years revealed a greater likelihood that patients with CD would develop extra-intestinal manifestations versus those with UC (20.1% vs. 10.4%, $p < 0.001$) [25]. Arthritis was the most frequently reported

Table 1 Consensus statements on overarching principles concerning the multidisciplinary approach to the management of spondyloarthritis-related immune-mediated inflammatory diseases (IMIDs)

Question	Statement	Consensus degree (%)
1. IMIDs and multidisciplinary approach: what is the context?	1a. Epidemiologic, clinical and prevalence studies demonstrate that patients with IMIDs, such as those with psoriasis, spondyloarthritis, inflammatory bowel diseases and non-infectious uveitis, have a higher risk of developing another related IMID than the normal population	100%
	1b. IMIDs including psoriasis, spondyloarthritis, inflammatory bowel diseases and non-infectious uveitis are interrelated, since they can occur concomitantly in the same patient and may share a similar genetic background. The use of drugs acting on pathways common to more than one IMID may lead to improved control and compliance in patients affected by more than one IMID	100%
	1c. A multidisciplinary approach in the management of patients can result in a more extensive evaluation of diseases and a more comprehensive treatment approach compared with traditional consultation. The goals of a multidisciplinary team include increasing the sensitivity in diagnosing a concomitant IMID, improving the decision-making process in IMID management and increasing patient satisfaction and adherence	100%
2. Could an IMID team ensure a practical and effective implementation of the multidisciplinary approach?	2. A multidisciplinary team can play a key role in the prompt diagnosis, referral, clinical management and follow-up of patients with IMID	100%
3. How could an IMID team increase the level of care throughout the pre-diagnosis, diagnosis and follow-up phases?	3. A multidisciplinary team could improve patient management as early referral and diagnosis, shared therapeutic strategy, patient awareness and follow-up programs are crucial for high-quality care. Furthermore the introduction of specialist nurses improves the level of care for both in- and outpatients	100%
4. Could the multidisciplinary approach be measured as an additional value?	4. Early recognition of the associated IMID and timely therapy may improve patient outcomes and prevent long-term complications	100%
5. What are the goals of the IMID team?	5. The goals of the IMID team should be: to provide an “early diagnosis” of any additional IMID; to optimize treatment, so as to improve patients’ quality of life and ensure the efficient use of available healthcare resources	100%

Table 1 continued

Question	Statement	Consensus degree (%)
6. Which tools can be used to achieve these goals?	6. Clinical examination, laboratory and instrumental tests indicated for specific conditions and patient-reported outcome tools are essential for IMID diagnosis and follow-up. However, no standardized referral tools for IMIDs are available at present. Defining shared “red flags” would make early referral and diagnosis possible for general practitioners and IMID team specialists	100%
7. Which specialists should be included in the IMID team?	In addition to a dermatologist, gastroenterologist and rheumatologist, the IMID team should include an ophthalmologist, psychologist, general practitioner, pediatrician and nurse:	85%
	7a. An ophthalmologist should always be involved in the multidisciplinary management of IMIDs because eye complications are frequent and serious and may impact the patients’ quality of life with skin, musculoskeletal or intestinal symptoms. IMID specialists should improve their ophthalmologic knowledge and vice versa to optimize specialist-ophthalmologist interaction and to implement shared management during treatment and follow-up	
	7b. The psychologic status of IMID patients should be taken into account during management of the disease. An appropriate psychologic support would improve the relationship with patients and increase compliance during treatment and follow-up	90%
	7c. General practitioners should be trained to recognize IMIDs early to reduce delays in diagnosis. General practitioners would therefore become an integral part of the patient awareness and educational process	90%
	7d. Cooperation with suitably trained IMID nurses could improve patient management by monitoring access to healthcare facilities and improving patient education	90%
	7e. At present no standardized transition care models exist that can only be applied to IMIDs. Models should be based on an integration between professionals involved in different healthcare settings (adult/pediatric care)	95%

extra-intestinal manifestation (12.9% vs. 8.1%, $p = 0.01$). The fact that CD patients are significantly more affected than UC patients by extra-intestinal manifestations was also reported by others [26]. Finally, a recent meta-analysis including 71 studies reporting the prevalence of SpA in IBD patients found that the pooled prevalence was 13% for arthritis, 10% for sacroiliitis and 3% for spondylitis [27].

The coexistence of IMIDs in the same patient and within families can be explained by the fact that they have a common genetic background and share pathogenetic mechanisms [1–4, 28]. The role of the human leukocyte antigen (HLA) B27 in conferring susceptibility to ankylosing spondylitis and other IMIDs is well established, although the mechanistic details of how HLA-B27 mediates joint inflammation have not been fully elucidated [29, 30]. Perhaps the most striking evidence of the overlapping pathophysiology of IMIDs comes from the clinical efficacy of biologic therapies targeting the same inflammatory pathway in a variety of IMIDs. This is reflected in the wide spectrum of IMID indications for TNF- α inhibitors. For example, adalimumab, a monoclonal antibody against TNF- α , is effective in RA, PsA, Pso (plaque psoriasis), IBD (CD, UC, pediatric CD and intestinal Behçet's disease), ankylosing spondylitis, non-radiographic axial SpA and juvenile idiopathic arthritis [28].

Role of the Multidisciplinary Team in the Implementation of Integrated SpA-Related IMID Management (Statement 2)

Recent literature suggests multiple roles for the multidisciplinary team including: improving diagnosis, optimizing treatment on an in- and outpatient basis, and enhancing patient satisfaction and involvement in their own care [31]. A multidisciplinary approach to patients with moderate-to-severe PsA was associated with improved treatment of skin and joint symptoms and a higher level of patient satisfaction, despite long waiting times [32]. According to the experience from a US combined dermatology and rheumatology clinic in the management of Pso and PsA, almost half of the more

than 500 patients referred to the clinic during a 6-year period received a revised diagnosis that was different from the diagnosis received at other centers [33]. Compared with before they attended the combined clinic, patients were more likely to be prescribed systemic medication and biologics. Similar results were reported by a Spanish study describing the 4-year experience of a new multidisciplinary Pso and PsA unit [34]. The multidisciplinary strategy improved diagnosis and symptom control and facilitated early diagnosis of SpA and timely treatment initiation [34]. Preliminary data from the experience of an Italian center with the integrated management of 145 patients with PsA by a dermatologist and a rheumatologist are also promising [35]. A positive impact on disease activity and quality of life (QoL) was reported after only 12 weeks of integrated management.

Impact of the Multidisciplinary Team on All Stages of SpA-Related IMID Management from Presentation to Long-Term Follow-Up (Statement 3)

Multidisciplinary care should be provided from the earliest steps of patient management. In patients with Pso, for example, the early detection of comorbidities is increasingly recognized as a crucial step in patient management. The 4-year experience of the Spanish PSORD multidisciplinary model that operates according to well-defined referral criteria has shown that this approach enables early diagnosis of PsA and subsequent timely treatment initiation [34]. A positive impact of a multidisciplinary care program on the timely initiation of intensive therapy has also been reported in a study comparing an integrated care program with the current standard of care in patients with early RA [36]. Regarding the role of the multidisciplinary approach during treatment and follow-up, a prospective study evaluating medical outcomes in 20 patients with RA receiving multidisciplinary management showed that all patients reported significant improvements in QoL after 3 and 6 months [37] and that this effect was sustained.

Outcome Measures for the Multidisciplinary Approach (Statement 4)

Developing and selecting adequate outcome measures of the effectiveness of integrated IMID care are challenging. In RA, the context in which multidisciplinary team care has been most extensively investigated, the use of function-specific and patient-related outcomes is recommended [38]. In a 10-year study, 55 patients with early RA were treated with a multidisciplinary approach including early and active use of disease-modifying anti-rheumatic drugs (DMARDs), outcome measures included HR-QoL (NHP), disease activity (DAS28), function (HAQ) and joint destruction (Larsen scores) [39]. Overall, all NHP dimensions except social isolation improved significantly during the first 6 months and remained favorable up to 10 years. Early improvements in HR-QoL were sustained over the 10-year observation period for patients with recent-onset RA treated with a multidisciplinary strategy that included early intensive DMARD therapy. A randomized controlled study in 46 patients with ankylosing spondylitis was conducted to compare a 3-week in-patient multidisciplinary rehabilitation program with conventional care [40]. Primary outcomes were disease activity measured with the BASDAI and function measured with the BASFI; secondary outcomes included well-being, spinal and hip mobility and HR-QoL measured with the SF-36. The 3-week multidisciplinary rehabilitation program was found to be more effective than conventional treatment in most outcomes considered.

Goals of the Multidisciplinary Team (Statement 5)

A large body of evidence from studies in patients with psoriatic disease suggests that one of the goals of the multidisciplinary approach is the early diagnosis of the IMIDs that coexist with the disease that has been diagnosed first. As Pso precedes PsA in 75–80% of patients, dermatologists clearly play a key role in the early diagnosis of PsA, and the collaboration

among dermatologists, radiologists and rheumatologists is crucial [41, 42]. Evidence shows that prompt initiation of treatment for PsA in patients with Pso can prevent the progression of joint damage and functional disability [43, 44]. Even a 6-month delay from articular symptom onset to the first visit to the rheumatologist contributes to the development of peripheral joint erosions and worse functional impairment [45]. The importance of cooperation between dermatologists and rheumatologists needs to be emphasized to improve the early detection of PsA and enable timely initiation of adequate treatment [46, 47].

Another important goal of the multidisciplinary team is to improve patient-physician communication. In the IBD setting, there is a generally recognized need to improve communication between patients and physicians especially regarding QoL and new treatment options [48]. The patient-physician relationship has been identified as one of the factors that affects adherence to prescribed medication, which is a common problem in UC [49, 50]. In particular, the patient-physician relationship appears to be critical in encouraging adherence through patient education, open communication and agreement on the value of the prescribed treatment [50].

Tools for Achieving the Goals (Statement 6)

In the setting of psoriatic disease, considerable effort has been devoted in recent years to the development of screening tools for the early diagnosis of PsA in patients with Pso, and validated PsA screening tools are available. Four validated screening tools have been recently compared in Pso patients [ToPAS II (Toronto Psoriatic Arthritis Screen II), PASE (Psoriatic Arthritis Screening and Evaluation), PEST (Psoriasis Epidemiology Screening Tool) and EARP (Early Arthritis for Psoriatic Patients)] [51]. EARP was found to have the most sensitivity while ToPAS the most specificity. The NICE guidelines recommend the annual use of PEST on all Pso patients without PsA [52, 53]; in the authors' experience, PEST and EARP are the most useful

and practical screening tools for PsA. Magnetic resonance imaging (MRI) and ultrasonography are other useful tools for the early diagnosis of PsA [54].

In the field of CD, recent efforts have been devoted to the identification of signs and symptoms (red flags) that should warn clinicians about the presence of this condition [55, 56]. A Red Flag index has been recently developed to improve early diagnosis of CD, but as yet it has not been validated [55].

Interesting new tools are available using mobile internet technologies. For example, a mobile internet-support service (t-RAppen) has been recently developed to improve self-management of physical activity in RA patients [57].

In recent years, patient-reported outcomes (PROs) have attracted interest as potential assessment tools. A recent study has evaluated alerts generated by a PRO measure-based algorithm for monitoring RA patients and found that the use of the algorithm to screen scheduled visits reduces the chance of missing patients in need of medication intensification [58]. A 7-year follow-up study has evaluated PROs as assessment tools and predictors of long-term prognosis in patients with RA [59]. However, the use of EULAR criteria including PRO for remission is controversial. The study found that the criteria are stringent but important to achieve sustained remission in RA.

When conventional radiography fails to provide conclusive information, MRI techniques are useful for the differential diagnosis, for example, in detecting early stage RA and PsA in the small hand and foot joints [60]. For the evaluation of hand and feet joints and surrounding soft tissue structures in RA and PsA, ultrasound and other imaging techniques are also useful [61].

The first EULAR recommendations for the use of imaging in the diagnosis and management of SpA were published in 2015 [62]. The recommendations encompass the entire spectrum of SpA and evaluate the full role of commonly used imaging techniques, namely: conventional radiography, ultrasound, MRI, computed tomography (CT), positron emission tomography, single-photon emission CT, dual-emission X-ray absorptiometry and

scintigraphy. The European Crohn's and Colitis Organisation (ECCO) recommends upper gastrointestinal endoscopy in the assessment of pediatric and adolescent IBD for classification purposes, and in general endoscopy is recommended to confirm diagnosis and in cases where management needs to be changed [63]. The ECCO guidelines on imaging techniques in IBD state that radiologic imaging techniques complement endoscopic assessment and can assist in the detection and staging of CD [64]; in addition, they state that imaging should be used at first diagnosis for staging and to monitor follow-up. Imaging techniques recommended for IBD include ultrasound, CT, MRI and scintigraphy with radiolabeled leukocytes [64]. Barium contrast and plain film radiology can also be used; however, the use of plain-film radiography is decreasing in favor of ultrasound and CT [64].

Specialists to Be Included in the IMID Team (Statements 7a, 7b, 7c, 7d, 7e)

Direct evidence supporting the inclusion of an ophthalmologist in the multidisciplinary team managing IMIDs is currently lacking. However, the high prevalence of uveitis in IMID patients justifies the presence of an ophthalmologist in the multidisciplinary team to manage eye disease manifestations that can be very bothersome [65, 66]. A study from the Spanish AQUILEA cohort estimated a 2-year incidence of new uveitis cases in patients with SpA of 3.1%, predominantly in patients with ankylosing spondylitis [67]. Conversely, it has been estimated that approximately 40% of patients presenting with idiopathic acute anterior uveitis have undiagnosed SpA [68]. An algorithm for the assessment of patients with acute anterior uveitis has been recently developed to assist ophthalmologists in the referral of patients to rheumatology clinics for early SpA diagnosis [68].

The literature documenting psychologic distress in IMIDs is extensive [69–72]. Psychologic distress in RA patients has a negative effect on pain outcomes [71, 73] and has been associated with poor adherence to treatment [74–76]. A

few studies, mostly in RA and Pso, have evaluated the impact of psychologic assistance on outcomes, with mixed results [77, 78].

International guidelines recommend the involvement of general practitioners (GPs) in the RA multidisciplinary team [9]. Various studies have investigated the relationship between GPs and rheumatologists regarding the referral of patients with inflammatory rheumatic diseases from primary care to rheumatology clinics [79–82]. According to the results of a survey among Flemish GPs, decisions about intensive treatment initiation in early RA should be made by rheumatologists [79]. Reported barriers to intensive treatment initiation included patients' resistance and non-adherence, lack of GP involvement and unsatisfactory collaboration with rheumatology services. A study assessing the knowledge of SpA among GPs showed that GPs are aware of classic features of ankylosing spondylitis [81, 82]. However, knowledge about the disease spectrum is limited, and early detection is rare. Addressing these issues in training programs may improve recognition of SpA in primary care.

The role of nurses in multidisciplinary team care of IMIDs has been investigated extensively, with most studies being in the field of chronic rheumatic diseases [83–92]. A Delphi consensus statement on multidisciplinary teams in IBD recommended the inclusion of an IBD nurse in such a team [31], and in general the inclusion of nurses in the IMID multidisciplinary team is widely recommended [9, 93]. However, the position of nurses within the multidisciplinary team varies markedly depending on the country. In addition, healthcare providers corresponding to the “nurse practitioner” of the UK or US healthcare systems do not exist in many countries, including Italy. As a consequence, many of the data and recommendations present in the literature about the role of nurses in multidisciplinary care of IMID may not be generally applicable. Recommendations defining the role of nurses in addressing unmet needs in the management of RA have been published [94]. The evidence shows that nurses usually spend more time with patients than doctors do; they also engage more in the socio-emotional

process of establishing a relationship with the patient [92]. Therefore, nurses are in a unique position to explore patient needs and address unmet needs, educate about treatment and self-injection techniques, monitor safety and progress, and coordinate treatment within the multidisciplinary setting [94]. The role of nurses in the education of psoriatic patients about healthier lifestyle habits that can reduce the risk of metabolic complications associated with Pso has also been suggested [95].

CONCLUSIONS

It is interesting to note that the 2009 NICE guidelines for the treatment of RA, while recognizing the lack of supporting evidence, recommend multidisciplinary team care because of the services it can provide to patients with RA [9]. The NICE guidelines also underline patients' perception of non-clinician members of the team (e.g., specialist nurses) as having more time for them [9]. Also lacking are guidelines recommending IMID-specific models of multidisciplinary management.

A recent survey among Spanish dermatologists and rheumatologists, who provided multidisciplinary care for patients with PsA, investigated different models [96]. Two essential characteristics for the implementation of interdisciplinary model were identified: involvement and empathy of team members and well-defined referral criteria. In the present Delphi process, all of the experts involved agreed about the related nature of IMIDs and the existence of a high prevalence of multiple IMIDs in a single patient. One hundred percent agreement was also obtained regarding the fact that a multidisciplinary approach can result in a more extensive evaluation of diseases and a more comprehensive approach to treatment. It was unanimously agreed that the goals of a multidisciplinary team for SpA-related IMIDs should be to increase the diagnosis of concomitant IMIDs to improve the decision-making process during management and to increase patient satisfaction and adherence to treatment. Early referral and diagnosis, early recognition of concomitant IMIDs and optimizing treatment

to improve patient QoL are some of the advantages of using multidisciplinary teams for SpA-related IMIDs. To be effective, the expert panel agreed that a multidisciplinary team should be equipped with the appropriate tools for diagnosis and follow-up and at a minimum the multidisciplinary team should include a dermatologist, gastroenterologist and rheumatologist; high agreement (90–95%) was also obtained regarding the importance of providing psychologic support via a psychologist and involving an ophthalmologist, GPs and nurses in multidisciplinary care.

We are aware that evidence supporting the effectiveness of the strategy used here is limited as only a few published studies have specifically assessed the impact of the multidisciplinary approach in terms of diagnostic and therapeutic improvement. Nonetheless, the current study has incorporated data from the literature (i.e., systematic research, therefore evidence based) with the opinion of experts (i.e., specialists of various disciplines with appropriate scientific background and direct clinical experience in multidisciplinary management). Importantly, this is the first study that has analyzed the advantages of the multidisciplinary approach from a double point of view (evidence-based plus personal experience) and that aims to spread the application for a better management of complex pathologies such as SpA-related IMIDs. Future multicenter studies with extensive case studies that specifically evaluate the impact of the multidisciplinary approach are needed. It would also be of interest to evaluate the advantages of the multidisciplinary approach in terms of economic benefits (i.e., early diagnosis and therefore lower disability, appropriate use of diagnostic methods, appropriate and shared use by more specialists of high-cost drugs).

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